

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to recite that the carrier is a granulate of a mixture of (a) a specified calcium silicate compound, and (b) a binder. In light of amendments to claim 1, claims 3 and 4 have been amended to recite “the” binder.

In addition, withdrawn claims 16-19 have been cancelled without prejudice or disclaimer, and in particular without prejudice to the filing of a Divisional application directed to the subject matter thereof.

Initially, it is respectfully requested that the present amendments be entered, notwithstanding the Finality of the Office Action mailed August 7, 2008. In this regard, clearly cancelling of claims 16-19 without prejudice or disclaimer is proper after Final, noting 37 CFR 1.116(b)(1).

In addition, it is respectfully submitted that amendments to claim 1, as well as corresponding amendments to claims 3 and 4, are appropriate under 37 CFR 1.116. In this regard, it is respectfully submitted that amendments to claim 1 do not raise any new issues, including any issue of new matter, noting previously considered claims 3 and 4. In addition, it is respectfully submitted that amendments to claim 1 materially limit issues remaining in the above-identified application, noting that the Examiner did not reject claims 3-5 over the combined teachings of Ueno, et al and Mizutani, et al. It is respectfully submitted that the present amendments at least present the claims in better form for appeal, limiting issues remaining in the above-identified application; and, as discussed infra, it is respectfully submitted that the claims as presently amended patentably distinguish over the teachings of the applied

prior art. Moreover, it is respectfully submitted that the present amendments are timely, especially in light of contentions in the Office Action mailed August 7, 2008.

It is respectfully submitted that the foregoing provides the necessary showing under 37 CFR 1.116(b)(3); and that, accordingly, entry of the present amendments is proper.

Applicants respectfully submit that all the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed August 7, 2008, that is, the teachings of the U.S. patents to Ueno, et al., No. 5,128,060, to Mizutani et al., No. 4,226,636, and to Sugihara, et al., No. 5,102,673, under the provisions of 35 USC 103.

Initially, recitation of the binder, forming a mixture with the specified calcium silicate compound, which mixture is granulated to provide the carrier, is noted. It is also to be noted that the Examiner did not reject claims 3 and 4, reciting the binder, over the combined teachings of Ueno, et al. and of Mizutani, et al. For this reason alone, it is respectfully submitted that the rejection of claims over the combined teachings of Ueno, et al. and of Mizutani, et al. is moot.

In any event, and in addition to reasons set forth in the following, it is respectfully submitted that the combined teachings of Ueno, et al. and of Mizutani, et al., discussed in detail infra, would have neither disclosed nor would have suggested such an oxygen-absorbing composition, or the oxygen-absorbing package including such oxygen-absorbing composition, as in the present claims, including, inter alia, wherein the carrier is a granulate of a mixture of (a) the specified calcium silicate compound and (b) a binder.

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such an oxygen-absorbing composition or package as in the present claims, having the carrier and an easily oxidizable organic composition carried thereon by impregnating a dried carrier with an easily oxidizable organic composition in liquid form, the carrier being a granulate of a mixture of a specific calcium silicate compound and a binder, and wherein the carrier is a granulate prepared by granulating and subsequently drying.

See claim 1.

Moreover, it is respectfully submitted that the applied references would have neither disclosed nor would have suggested such an oxygen-absorbing composition as in the present claims, having features as discussed previously in connection with claim 1, and, moreover, wherein the carrier is a granulate prepared by granulating a mixture comprising 100 parts by weight of the calcium silicate compound and 0.01-20 parts by weight of binder (see claim 3); and/or is a granulate prepared by granulating a mixture comprising specific amounts of the calcium silicate compound, activated carbon and the binder (see claim 4).

As discussed infra, the applied references do not disclose, nor would have suggested, the carrier being a granulate prepared by granulating, and subsequently drying, and the granulate being a mixture including, in addition to the calcium silicate compound, a binder, especially wherein the mixture includes the calcium silicate compound in the present claims, and advantages thereof.

Moreover, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such an oxygen-absorbing composition as in the present claims, having features as discussed previously in connection with claim 1, and, in addition, having features as in the

composition claims ultimately dependent on claim 1, including (but not limited to) wherein the easily oxidizable organic composition is carried on a carrier in the amount as set forth in claim 2; and/or the specific materials for the binder and for the easily oxidizable organic compound as set forth in claims 5 and 8, respectively; and/or wherein the composition includes an additive for putting the easily oxidizable organic compound in chemically easily oxidizable condition and/or water (see claim 7), in particular, wherein the additive is a material as in claim 9; and/or wherein n of the formula for the calcium silicate compound is from 1.0-1.5 (see claim 6); and/or makeup of the easily oxidizable organic composition as in claims 10 and 11; and/or wherein the plate crystals are aggregated into corollaceous crystal structures (see claim 13); and/or wherein the granulate has an average particle size of 100 µm or more (see claim 14); and/or wherein the easily oxidizable organic composition, carried on the carrier, is in a homogenous liquid form (see claim 15).

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested an oxygen-absorbing package as in the present claims, which includes the oxygen-absorbing composition as in claim 1 packed by a gas-permeable packaging material. See claim 12.

In addition, even assuming, arguendo, that the teachings of the references as applied by the Examiner would have established a prima facie case of obviousness, the evidence of record, in particular, the Declaration Under 37 CFR 1.132 submitted with the Amendment filed April 25, 2008, overcomes any such prima facie case of obviousness, and establishes unobviousness of the presently claimed subject matter.

In connection with the aforementioned Declaration, note the averment by the Declarant in the first full paragraph on page 2 of the Declaration, that the present invention provides superior reduction of size of the oxygen-absorbing package, i.e., superior compactness of the package, achieved by combination of use of the dried calcium silicate carrier of the present invention and impregnation thereof with the oxidizable composition recited in the present claims. Experimentation in Items 4-6 on pages 2-6 of the Declaration establish such superiority, unexpected from the teachings of the applied references.

In particular, attention is directed to the Conclusions in Item 6 on page 6 of this Declaration. Note especially Conclusion 6-3, stating that from the comparison of E3-2 with E3-3 (E3-3 falling within the scope of the present invention), it can be seen that superior compactness is achieved by impregnating the dried calcium silicate carrier recited in the present claims with an oxidizable composition recited in the present claims, in particular, with an oxidizable composition which is homogeneously dissolved (note claim 15). As stated in this Conclusion 6-3, superior compactness of the present invention is achieved by impregnating the dried calcium silicate carrier recited in the present claims with the oxidizable composition thereof.

Note also Conclusion 6-2, stating that from both E3-1 and E3-2, superior compactness is not achieved by treating each of the silica gel carriers of U.S. Patent No. 5,128,060 (see Example 1 thereof) with a calcium silicate carrier before granulating, as in Example 1 of the above-identified application and as in the present claims. In this regard, it is respectfully submitted that U.S. Patent No. 5,128,060 constitutes the closest prior art, and it is respectfully submitted that the evidence in this Declaration provides a fair comparison of the present invention with the closest prior art.

Especially with respect to claim 15, note also Conclusion 6-1 of this Declaration, which states that from both E2-1 and E3-1, superior compactness is not achieved by treating a carrier with an oxidizable composition (as in Example 1 of U.S. Patent No. 5,128,060) which is not homogeneously dissolved.

Thus, it is respectfully submitted that the Declaration establishes unexpectedly better results achieved by the present invention.

The statement by the Examiner on page 8 of the Office Action mailed August 7, 2008, that is not clear how the compactness of a composition relates to the limitations of the claims, is noted. As is clear from the foregoing, it is respectfully submitted that the Declaration clearly shows that structural recitations of the carrier and easily oxidizable organic composition carried on the carrier, "by impregnating a dried carrier with an easily oxidizable organic composition in liquid form" (emphasis added), provides the properties of the oxygen-absorbing composition whereby good absorption is achieved in a package having superior compactness.

Applicants respectfully traverse the conclusion by the Examiner on page 8 of the Office Action mailed August 7, 2008, that the showing in the Declaration is not commensurate in scope with the claims. The Examiner has not pointed out insufficiencies of the showing, with respect to the scope of the claims. In connection therewith, note 35 USC 132. Thus, Applicants are at a loss in addressing this issue. Suffice it to say, however, that the showing in a Declaration need not provide illustrations for each and every species within the claims. It is respectfully submitted that the aforementioned Declaration, providing results as in Example 1, together with statements under oath in Applicants' specification, provide a showing sufficiently commensurate in scope with the claims for overcoming any possible prima facie case of obviousness established by the teachings of the applied prior art.

The present invention is directed to an oxygen-absorbing composition and method of production thereof, the composition containing an organic compound as a principal ingredient for removing oxygen from the environment containing such composition.

As described in Applicants' specification, as one of the techniques for preserving foods and medicines, known is a preservation method using an oxygen-absorbing agent. Generally, the oxygen-absorbing agent is made into an oxygen-absorbing package by packing an easily oxidizable composition into small bags made of a gas-permeable material, the package being placed in a package with, e.g., foods and/or medicines to be preserved. Organic oxygen-absorbing agents have been proposed, as described in the paragraph bridging pages 2 and 3 of Applicants' specification; in particular, liquid organic oxygen-absorbing agents carried on inorganic carriers have been proposed. Problems with such inorganic carriers are described in the paragraph bridging pages 1 and 2, the two full paragraphs on page 2, and the paragraph bridging pages 2 and 3, of Applicants' specification.

It is still desired to provide an oxygen-absorbing composition containing an organic compound as an easily oxidizable material, which can carry a large amount of the organic compound, which is not detected by a metal detector, and which is excellent in oxygen-absorbing ability per unit volume. By providing a material excellent in oxygen-absorbing ability per unit volume, the amount of packaging material to be used can be reduced.

As a result of intensive studies by Applicants, the Applicants have found that a carrier which is a granulate of a mixture of (a) a calcium silicate compound as recited in claim 1 and (b) a binder (i.e., the carrier being a granulate prepared by granulating

and subsequently drying) can carry a large amount of the easily oxidizable organic composition serving as an oxygen-absorbing composition (carried on the carrier by impregnating a dried carrier with the organic composition in liquid form), and is excellent in total oxygen absorption per unit volume, oxygen-absorbing speed and handling ability.

In particular, Applicants have found that by utilizing a dried carrier of the mixture recited in the present claims, prepared by granulating and subsequently drying, with the easily oxidizable organic composition in liquid form being impregnated in the dried calcium silicate carrier, superior reduction of the size of the oxygen absorbing package, that is, superior compactness of the package, is achieved.

As for the unexpectedly better results of superior compactness of the package, achieved by the present invention, attention is again respectfully directed to the Declaration under 37 CFR 1.132 submitted with the Amendment filed April 25, 2008. Note particularly the experiments described therein, in Item 4 on pages 2-5 of this Declaration. Note also the results of the Declaration, shown by photographs in Fig. A on page 5 of the Declaration. As described under the heading "Conclusion" on page 6 of the Declaration, from both E2-1 and E3-1, it can be seen that superior compactness is not achieved by treating a carrier with an oxidizable composition which is not homogeneously dissolved (note especially claim 15); and from both E3-1 and E3-2, superior compactness is not achieved by treating each of the silica gel carrier and a calcium silicate carrier before granulating. Moreover, from the comparison of E3-2 with E3-3, superior compactness is achieved by impregnating "the dried calcium silicate carrier" as in the present invention, with an oxidizable

composition which is homogenously dissolved, that is, with the oxidizable composition of the present invention.

Thus, by the combination of using a carrier which is a granulate of a mixture of the specific calcium silicate compound in claim 1 and a binder, the granulate being prepared by granulating and subsequently drying, and by utilizing an easily oxidizable organic composition carried on the carrier by impregnating a dried carrier with an easily oxidizable organic composition in liquid form, in particular, wherein the easily oxidizable organic composition is in a homogenous liquid form, unexpectedly better results are achieved in providing good oxygen removal in a compact structure.

Sugihara, et al. discloses an oxygen absorbent comprising boron, or a reducing boron compound, an alkaline substance and a carrier. See column 2, lines 53-55. This patent discloses that the composition comprising boron, or a reducing boron compound, an alkaline substance and a carrier, has an excellent oxygen absorbing ability in combination with a drying function and an acidic gas absorbing ability. See column 2, lines 45-51. Note also column 3, lines 10-18 of this patent. As for the carriers, note column 3, lines 52-59 of this patent. This patent further discloses that to granulate the oxygen absorbent and thereby to improve its flowability in filling operation, there may be used fillers such as zeolite, perlite, diatomaceous earth, activated clay, silica, kaolin, talc, bentonite, and activated alumina, among other materials; and that, further, there may be favorably used as a binder for granulation glycerol, sorbitol, glucose, sucrose, polyacrylic acid, polyvinyl alcohol, lysine, etc. Note column 4, lines 51-60.

It is respectfully submitted that Sugihara, et al. would have neither disclosed or suggested such an oxygen-absorbing composition as in the present claims, including, inter alia, use of the dried carrier which is impregnated with the easily

oxidizable organic composition in liquid form, with the carrier being a granulate of a mixture of the specific calcium silicate compound in claim 1 and the binder, and with the carrier being a granulate prepared by granulating and subsequently drying, and advantages of such claimed composition as discussed previously and as shown by the evidence of record.

The contention by the Examiner that the present claims are “product-by-process” claims, and the reference by the Examiner to Manual of Patent Examining Procedure 2113, for example, in the paragraph bridging pages 3 and 4, and on pages 7 and 8, of the Office Action mailed August 7, 2008, is noted. Contrary to the conclusion by the Examiner, it is respectfully submitted that the Examiner defines structure, e.g., a dried carrier.

In any event, it is respectfully submitted that where the recited processing provides a different product, particularly having expectedly better characteristics, such processing must be considered in determining patentability. See In re Luck, 177 USPQ 523, 525 (CCPA 1973). It is respectfully submitted that under the present circumstances, Applicants have shown in, e.g., the aforementioned Declaration, that the processing provides a product having unexpectedly better characteristics (e.g., superior compactness of the oxygen absorbing package), whereby the processing must be considered in determining patentability of the present claims.

It is respectfully submitted that the additional teachings of Mizutani, et al. and of Ueno, et al. would not have rectified the deficiencies of Sugihara et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Ueno, et al. discloses an oxygen absorbent comprising ascorbic acid and/or salt thereof, an alkaline compound, a reaction accelerator and silica gel. See

column 2, lines 10-12. As for the alkaline compound, note column 2, lines 46-51. As for the reaction accelerator, note column 3, lines 4-6. This patent discloses that the silica gel may be a liquid phase producing silica gel which is prepared, for example, by decomposing a sodium silicate with an acid in a liquid phase, or a vapor phase producing silica gel. This patent discloses that though there are silica gels containing micropores and those having substantially no micropore, the latter is more preferable. Note column 3, lines 45-55.

It is emphasized that Ueno, et al. discloses use of a silica gel carrier, preferably having no micropores. It is respectfully submitted that this reference would have neither taught nor would have suggested, alone or in combination with the teachings of the other applied references, such composition or method as in the present claims, including wherein the carrier is a granulate of a mixture of the recited calcium silicate compound and binder, and is a granulate prepared by granulating and subsequently drying, or wherein the easily oxidizable organic composition is carried on the carrier by impregnating a dried carrier with an easily oxidizable organic composition in liquid form, or unexpectedly better advantages achieved thereby.

Mizutani, et al. discloses a process for producing calcium silicate, and a calcium silicate-gypsum composition having a petal-like structure which can absorb a very large amount of oils. The calcium silicate is disclosed most generally in column 1, lines 40-48. See also column 2, lines 6-16 of Mizutani, et al., disclosing a process for producing the calcium silicate. Note also column 2, lines 48-51; and column 3, lines 23-25.

Mizutani, et al. discloses a calcium silicate absorbing a large amount of oil. It is respectfully submitted that one of ordinary skill in the art involved in Sugihara, et

al., including a boron-containing compound, or in Ueno, et al., including ascorbic acid and/or salts thereof, would not have looked to the teachings of Mizutani, et al., describing oil-absorbing materials.

Even assuming, arguendo, that the teachings of Mizutani, et al. and of Ueno, et al. were properly combinable with the teachings of Sugihara, et al., such combined teachings would have neither disclosed nor would have suggested the presently claimed subject matter, including, the composition wherein the carrier is a granulate of a mixture of the specifically recited calcium silicate compound and a binder, and is a granulate prepared by granulating and subsequently drying, and with the easily oxidizable organic composition carried on the carrier by impregnating a dried carrier with the easily oxidizable organic composition in liquid form; and/or other features of the present invention as discussed previously, and advantages of all features of the present invention.

It is respectfully submitted that the combined teachings of the applied references, either Ueno, et al. and Mizutani, et al., or Sugihara, et al., Ueno, et al. and Mizutani, et al., would have neither disclosed nor would have suggested the unexpectedly better results achieved by the present invention, in compact size while achieving good oxygen absorption, as shown by the aforementioned Declaration.

Contentions by the Examiner in the third paragraph on page 6 of the Office Action mailed August 7, 2008, are noted. It is respectfully submitted that the Examiner is taking bits and pieces of the applied references, while ignoring the full teachings thereof. For example, the Examiner applied the teachings in Ueno, et al. of use of ascorbic acid, while ignoring teachings thereof of a silica gel carrier. It is respectfully submitted that such use of bits and pieces of the applied references,

ignoring the teachings of these references as a whole, is improper under the guidelines of 35 USC 103.

In view of the foregoing comments and amendments, entry of the present amendments, and reconsideration and allowance of all claims remaining in the above-identified application, are respectfully requested.

If the Examiner believes that there are any other points which may be clarified or otherwise disposed of either by telephone discussion or by personal interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Antonelli, Terry, Stout & Kraus, LLP Deposit Account No. 01-2135 (Docket No. 396.44985X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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